

U.G. 5th Semester Examination - 2021**PHYSICS****Course Code : BPHSDSHT3 [DSE3]****Course Title : Astronomy & Astrophysics**

Full Marks : 40

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **ten** questions: $1 \times 10 = 10$
- In what wavelength region would you look for a star being born ($T=3000\text{K}$)?
 - Define emission and absorption spectra.
 - What are solar flares?
 - Which electromagnetic radiation fall on earth's surface without any considerable loss?
 - What are red giant stars?
 - What is the equatorial rotational speed of earth?

- Which one is the hottest planet in the solar system?
- What type of star is our sun?
- How long does it take for a spaceship at the speed of 30km/sec to reach our nearest star Alpha centauri?
- Write down some notable works of Gallileo in the field of Astronomy.
- Write down virial theorem related with stellar structure.
- Define luminosity of a star.
- What do you mean by resolving power of a telescope?
- Why atomic spectra of different elements are not same?
- Which elements are most abundant in the universe?

2. Answer any **five** questions: $2 \times 5 = 10$
- Discuss shortly about the relation between luminosity, temperature and radius of a star.
 - Calculate the frequency of the highest intensity radiation of a black body whose temperature is : (i) 600K (ii) 2500K .

- c) Distinguish between stars of population-I and II. Where are they found in the Galaxy?
- d) Suppose molecules at rest emit with a wavelength of 18cm. You observe them at a wavelength of 18.01cm. How fast the object is moving?
- e) What is the difference between a spectrometer and a camera?
- f) What are vernal and autumnal equinoxes?
- g) Discuss shortly about magnifying power and light gathering power of telescopes.
- h) How atomic spectra depends on temperature?

3. Answer any **two** questions: 5×2=10

- a) What is Schwarzschild radius of black hole? Determine the Schwarzschild radius of the sun. Explain the result. 2+2+1
- b) Discuss about various stellar nucleosynthesis process. 5
- c) What is Rayleigh Criterion? Discuss role of the principle of hydrostatic equilibrium in stellar structure. 2+3

4. Answer any **one** question: 10×1=10

- a) Discuss about solar Corona. Calculate the temperature at which a particle will have sufficient energy to ionize a hydrogen atom. The temperature of chromosphere and corona is very very high in comparison to that of the photosphere. Still, we observe that the photosphere is the brightest of the three. Why? Discuss about nebular model of solar system. 3+3+2+2
- b) Discuss stellar classification using H-R diagram. briefly explain the following term: Protostar, Main Sequence star, White dwarf. 4+6
- c) Discuss shortly the necessity and effectiveness of space telescopes. What is stellar parallax? How one can measure stellar radii? The apparent magnitude of full moon is 12.5 and that of Venus at its brightest is 4.0. Which is brighter and by how much? 3+2+3+2
